Lloyd's Register

Rules and Regulations for the Classification of Ships, July 2012

Notice No. 6

Effective Date of Latest Amendments:

See page 1

Issue date: February 2013

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RULES AND REGULATIONS FOR THE CLASSIFICATION OF SHIPS, *July 2012*

Notice No. 6

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Classification of Ships, July 2012.* The amendments are effective on the dates shown:

Part	***Chapter***	***Section***	***Effective date***
3	13	1, 2	1 January 2013
5	12	7	Corrigendum

It will be noted that the amendments also include corrigenda, which are effective from the date of this Notice.

The *Rules and Regulations for the Classification of Ships, July 2012* are to be read in conjunction with this Notice No. 6. The status of the Rules is now:

Rules for Ships	Effective date:	July 2012
Notice No. 1	Effective date:	1 July 2012
Notice No. 2	Effective date:	1 October 2012
Notice No. 3	Effective date:	1 January 2013 & Corrigenda
Notice No. 4	Effective date:	1 January 2013
Notice No. 5	Effective date:	1 January 2013
Notice No. 6	Effective date:	1 January 2013 & Corrigendum

Part 3, Chapter 13
Ship Control Systems

Effective date 1 January 2013

■ *Section 1* General

1.5 Materials

1.5.1 The requirements for materials are contained in the *Rules for the Manufacture, Testing and Certification of Materials* (hereinafter referred to as the Rules for Materials).

~~*1.5.2* Cast steel stern frames, rudder horns, shaft brackets and sole pieces are to be manufactured from special grade material as specified in Ch 4,2 of the Rules for Materials.~~

1.5.2 Stern frames, rudder horns, shaft brackets, rudder stocks, pintles, coupling bolts, keys, and other rudder members are to be made of rolled, forged or cast carbon manganese steel in accordance with Chapters 3, 4 and 5 of the Rules for Materials. Cast steel stern frames, rudder horns, shaft brackets and sole pieces are to be manufactured from special grade material as specified in Ch 4,2 of the Rules for Materials.

■ *Section 2* Rudders

2.1 Design considerations

2.1.1 Effective means are to be provided for supporting the weight of the rudder without excessive bearing pressure, e.g., by a rudder carrier attached to the upper part of the rudder stock. The hull structure in way of the rudder carrier is to be suitably strengthened.

2.1.2 Suitable arrangements are to be provided to prevent the rudder from lifting.

2.1.3 In rudder trunks which are open to the sea, a seal or stuffing box is to be fitted above the deepest load waterline, to prevent water from entering the steering gear compartment and the lubricant from being washed away from the rudder carrier. If the top of the rudder trunk is below the deepest waterline, two separate stuffing boxes are to be provided. Rudder trunk boundaries, where exposed to the sea, are to have a corrosion protection coating applied in accordance with the manufacturer's instructions.

Existing sub-Sections 2.1 *to* 2.3 *have been renumbered* 2.2 *to* 2.4.

~~2.4~~ 2.5 Rudder stock and ~~main~~ bearings

~~*2.4.8* The design of the lowest bearing is to comply with the requirements of Table 13.2.6. Fitting of bearings is to be carried out in accordance with the bearing manufacturer's recommendations to ensure that they remain secure under all foreseen operating conditions.~~

Existing paragraphs 2.4.1 *to* 2.4.7 *have been renumbered* 2.5.1 *to* 2.5.7.

2.5.8 Bearings are to comply with the requirements of Table 13.2.6. The fitting of bearings is to be carried out in accordance with the manufacturer's recommendations to ensure that they remain secure under all foreseeable operating conditions.

Existing paragraph 2.4.9 *has been renumbered* 2.5.9.

Existing sub-Sections 2.5 *to* 2.8 *have been renumbered* 2.6 *to* 2.9.

~~2.9~~ 2.10 Ancillary items

Existing paragraph 2.9.1 *has been renumbered* 2.10.1.

~~*2.9.2* Suitable arrangements are to be provided to prevent the rudder from lifting.~~

Existing paragraphs 2.9.3 *and* 2.9.4 *have been renumbered* 2.10.2 *and* 2.10.3.

~~*2.9.5* In rudder trunks which are open to the sea, a seal or stuffing box is to be fitted above the deepest load waterline, to prevent water from entering the steering gear compartment and the lubricant from being washed away from the rudder carrier. If the top of the rudder trunk is below the deepest waterline, two separate stuffing boxes are to be provided. Rudder trunk boundaries where exposed to the sea are to have a corrosion protection coating applied in accordance with the manufacturer's instructions.~~

Existing paragraph 2.9.6 *has been renumbered* 2.10.4.

Table 13.2.6 Bearing requirements for rudder stock and pintles

Item	Requirement	
(1) Bearing surface area	$A_B = \dfrac{B}{q_a}$ mm^2	
(2) Bearing length	The length/diameter ratio of the actual bearing surface is not to be greater than 1,2	
(3) Clearance	Bearing material	Minimum clearance (on diameter)
	Metal	$0{,}001\delta + 1{,}0$
	Synthetic	*See* Notes 1, 3, 4 and 5
(4) Rudder stock main bearing wall thickness	Lesser of 0,2δ or 100	*See* Note 2
(5) Gudgeon thickness in way of pintle (measured outside bush if fitted)	$b_G \geq 0{,}25\delta$ but need not normally exceed 125 mm	

Symbols

A_B = bearing surface area, in mm^2, defined as the projected area (length x diameter) of liner
b = distance, in metres, from centre of rudder area to the centre of lowest bearing
b_G = thickness of gudgeon material in way of pintle, in mm
c = distance, in metres, from centre of lower pintle to the centre of lowest bearing
d = distance, in metres, from centre of lowest bearing to the centre of upper bearing. In the case of semi spade rudder with two pintles, d, is to be measured between the centre of upper pintle and centre of upper bearing
δ = diameter of stock, δ_S, given in Table 13.2.3, or pintle, δ_{PL}, given in Table 13.2.11, in mm
l_B = length of bearing, in mm
q_a = maximum surface pressure, *see* Table 13.2.7
B = bearing force, in N. If direct calculations are not carried out, the bearing force at various positions can be taken as:
$B_2 = \left(1 - \dfrac{b}{c}\right)P_L$, at lowest main bearing for single pintle rudders and semi-spade rudders, *see* Fig. 13.2.4(a), (c) and (d). B_2 is not to be less than $0{,}35P_L$
$B_2 = P_L + B_3$, at lowest main bearing for spade rudders, *see* Fig. 13.2.4(b)~~.~~
$B_3 = \dfrac{M_B}{d}$, at upper bearing for spade rudders, *see* Fig. 13.2.4(b). For bearing force at pintles, *see* Table 13.2.11~~.~~

NOTES
1. If non-metallic bearing material is applied, the bearing clearance is to be specially determined considering the material's swelling and thermal expansion properties. This clearance is ~~normally~~ not to be less than 1,5 mm on bearing diameter unless a smaller clearance is supported by the manufacturer's recommendation and there is documented evidence of satisfactory service history with a reduced clearance.
2. Where web stiffening is fitted on the bearing, a reduction in wall thickness will be considered.
3. For bearings which are pressure lubricated the clearance must be restricted to enable the pressure to be maintained.
4. The value of the proposed minimum clearance is to be indicated on plans submitted for approval.
5. Proposals for higher pressures or other materials will be specially considered on the basis of satisfactory test results.

Part 5, Chapter 12

Piping Design Requirements

CORRIGENDUM

■ *Section 7*
Flexible hoses

7.4 Testing

7.4.2 For a particular hose type complete with end fittings, the tests, as applicable, are to be carried out on different nominal diameters for pressure, burst, impulse and fire resistance in accordance with the requirements of the relevant Standard. The following Standards are to be used as applicable:

- ISO 6802 – *Rubber and plastics hoses and hose assemblies with wire reinforcements – Hydraulic ~~pressure~~ impulse test ~~without~~ with flexing*.
- ISO 6803 – *Rubber ~~and~~ or plastics hoses and hose assemblies – Hydraulic-pressure impulse test ~~with~~ without flexing*.
- ISO 15540 – *Ships and marine technology – Fire resistance of hose assemblies – Test methods*.
- ISO 15541 – *Ships and marine technology – Fire resistance of hose assemblies – Requirements for test bench*.
- ISO 10380 – *Pipework – Corrugated metal hoses and hose assemblies*.

Other Standards may be accepted where agreed by LR.

Cross-references

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Ships.

Part 1, Chapter 2

2.3.11	Pt 3, Ch 13,2.8 *now reads* Pt 3, Ch 13,2.9

Part 3, Chapter 13

2.2.1 (***2.3.1***)	2.1 *now reads* 2.2
2.3.1 (***2.4.1)***	2.1.1 *now reads* 2.2.1
2.4.7 (***2.5.7***)	2.8.3 *now reads* 2.9.3
2.8.3 (***2.9.3***)	2.9.6 *now reads* 2.10.4
Table 13.2.3	2.1.1 *now reads* 2.2.1
	2.2 *now reads* 2.3
	2.3 *now reads* 2.4
Table 13.2.10(a)	2.1.1 *now reads* 2.2.1
	2.4.2 *now reads* 2.5.2 (3 times)
	2.7.4 *now reads* 2.8.4
	2.7.5 *now reads* 2.8.5
Table 13.2.11	2.1.1 *now reads* 2.2.1
3.2.7	2.6 *now reads* 2.7
3.4.1	2.4 *now reads* 2.5
	2.5 *now reads* 2.6

Part 5, Chapter 20

3.2.2	Pt 3, Ch 13,2.1.1 *now reads* Pt 3, Ch 13,2.2.1
	Pt 3, Ch 13,2.2.1 *now reads* Pt 3, Ch 13,2.3.1

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